DOCUMENT RESUME

ED 381 580 TM 023 049

AUTHOR Velotta, Cynthia L.
TITLE Teacher Shortages in the United States: Outlook for the Future.
PUB DATE Oct 94
NOTE 17p.; Paper presented at the Annual Meeting of the Mid-Western Educational Research Association (October 12-15, 1994).
PUB TYPE Reports - Evaluative/Feasibility (142) -- Speeches/Conference Papers (150) -- Statistical Data (110)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Age Differences; Class Size; *Demography; Elementary Secondary Education; *Employment Patterns; Enrollment; *Futures (of Society); Geographic Regions; *Labor Market; Population Distribution; Public Schools; Tables (Data); Teacher Characteristics; *Teacher Shortage; *Teacher Supply and Demand; Teaching (Occupation)

ABSTRACT

The outlook for teacher employment in public education is important to current and future teachers and policymakers of elementary, secondary, and higher educational institutions. The number of teachers needed is dependent on several factors including: (1) population of school-age children; (2) number of existing teachers; (3) age of the existing teacher population; and (4) class size. Changing geographical population distributions and areas of teaching specialization are additional factors that affect prospects for employment. This paper describes demographic characteristics of teachers and students as well as characteristics of the job market to reveal current and potential teacher shortages. The primary source of demographic information was the National Center for Education Statistics. The investigation reveals shortages of teachers in various fields and geographic regions. Suggestions for policymakers and prospective teachers are provided. Five tables summarize data on teachers. (Contains 6 references.) (Author/SLD)

Teacher Shortages in the United States:

Outlook for the Future

Cynthia L. Velotta
The Ohio State University

Paper Presented at the Annual Meeting of the Mid-Western Educational Research Association

October 12-15, 1994

Abstract

The outlook for teacher employment in public education is important to current and future teachers and policymakers of elementary, secondary, and higher educational institutions. The number of teachers that are needed is dependent upon several factors including: (a) population of school-age children, (b) number of existing teachers, (c) age of the existing teacher population, and (d) class size. Changing geographical population distributions and areas of teaching specialization are additional factors that affect prospects for employment. This paper describes demographic characteristics of teachers and students as well as characteristics of the job market to reveal current and potential teacher shortages. The primary source of demographic information was the National Center for Educational Statistics. This investigation revealed shortages of teachers in various fields and geographic regions. Suggestions for policymakers and prospective teachers are provided.

Teacher Shortages in the United States:

Outlook for the Future

The outlook for teacher employment in public education is important to current and future teachers and policymakers of elementary, secondary, and higher educational institutions. The number of teachers that are needed is dependent upon several factors including: (a) population of school-age children, (b) number of existing teachers, (c) age of the existing teacher population, and (d) class size. Changing geographical population distributions and areas of teaching specialization are additional factors that affect prospects for employment.

A recent report by the Association for School, College, and University Staffing (ASCUS, 1993) asserted that economic status, postponement of early retirement, and educational reform efforts are creating "...a less than optimal environment for the availability of new teaching positions" (p.1). However, the results of a recent ASCUS survey revealed some teaching fields and regions of the country where there were perceived teacher shortages.

Projections by the National Center for Educational Statistics (NCES) provided a more promising outlook for prospective teachers in the next ten years. Specifically, Hussar (1993) estimated that the number of public school classroom teachers will increase by 16 percent. That represents an increase of 12 percent elementary and 23 percent secondary classroom teachers.

In this paper I will develop a demographic profile of teachers and projected teacher shortages in the United States using information from the Association for School, College, and University Staffing and the National Center for Educational Statistics (NCES). This paper is organized into three parts. The first section contains information on the factors described above that influence teacher supply and demand. The second section consists of a discussion of projected teachers shortages. The final section contains conclusions.

Factors Influencing Teacher Supply and Demand

As outlined earlier, there are a number of factors that influence the number and type of teachers that will be needed. This section includes information regarding: demography of students, demography of teachers, and characteristics of the job market by teaching area and geographic location.

Demography of Students

Change in the population of school-age children is one indication of where additional or fewer teachers will be needed. The population of children under age five (N=19,222,000) is at its highest level in over 25 years (Snyder, 1993). The population of this age group has been steadily increasing since 1977 when the population was 15,564,000. From 1981 to 1992 the population of 5-13 year-old children increased by 7 percent and the population of children aged 14-17 decreased 13 percent (Snyder & Hoffman, 1993). Both populations are expected to increase through 2003. These population increases will have an effect on public school enrollment. Table 1 provides public school enrollment figures for 1981, 1991, and projections for 1998 and 2003. Projected estimates of enrollment revealed that there will be substantial increases in secondary-level students (24 percent) and elementary-level students (15 percent) to 2003.

Table 1. Public School Enrollments (in thousands)

	Fall 1981	Fall 1991	Change 1981-1991	Estimated Fall 1998	Change 1991-1998	Estimated Fall 2003	Change 1991-2003
Elementary	27,280	30,470	12%	33,798	11%	34,955	15%
Secondary	12,764	11,530	-10%	13,632	18%	14,325	24%
Total	40,044	42,000	5%	47,430	13%	49,280	17%

(Sources: Hussar, 1993; Snyder & Hoffman, 1993)

Enrollment in public schools changed by state and region. From 1987 to 1991, six states and the District of Columbia had enrollment decreases (see Table 2). The largest enrollment decrease was in West Virginia and District of Columbia (7 percent decrease). Other states that had public school enrollment decreases were: Louisiana, North Dakota, Alabama, Indiana, and Ohio.

Six states (Alaska, Washington, California, Arizona, Florida, and Nevada) had enrollment increases in public schools of more than ten percent. As shown in Table 2, sixteen states had increases in enrollment between five and ten percent.

Changes in racial and ethnic composition of students can create challenges for schools. From 1976 to 1990, total minority enrollment in public schools increased 25 percent. The black student enrollment decreased two percent; however, the Hispanic population grew 68 percent and the Asian student population grew over 150 percent (Alsalam, Fischer, Ogle, Rogers, and Smith, 1993).

Table 3 provides 1990-1991 racial/ethnic breakdown of students by the type of community: central city, urban fringe/large town, and rural/small town. Over 50 percent of students in central city public schools were minority. Almost 30 percent were black and 20 percent were Hispanic. In the urban fringe/large town category, 28 percent of the students were minority. The minority percentage in rural/small town was 18 percent.

Table 2. Public School Enrollments and Percent Change from 1987 to 1991.

Region/State	1987	1991	% change
Northwest	**1444094**	**1593621**	**10%**
Idaho	212444	225680	6%
Oregon	455895	498614	9%
Washington	775755	869327	12%
West	**5652558**	**6432365**	**14%**
Arizona	572421	656980	15%
California	4488398	5107145	14%
Nevada	168353	211810	26%
Utah	423386	456430	8%
Rocky Mountain	**1098127**	**1159550**	**6%**
Colorado	560236	593030	6%
Montana	152207	155779	2%
New Mexico	287229	308667	7%
Wyoming	98455	102074	4%
Great Plains	**2939400**	**3067232**	**4%**
Iowa	480826	491363	2%
Kansas	421112	445390	6%
Minnesota	721481	773571	7%
Missouri	802060	827404	3%
Nebraska	268100	279552	4%
North Dakota	119004	118376	-1%
South Dakota	126817	131576	4%
South Central	**5051128**	**5256741**	**4%**
Arkansas	437036	438518	0%
Louisiana	793093	765589	-3%
Oklahoma	584212	588263	1%
Texas	3236787	3464371	7%
Southeast	**8501534**	**8877027**	**4%**
Alabama	729234	722004	-1%
Florida	1664774	1932131	16%
Georgia	1110947	1177569	6%
Kentucky	642696	646024	1%
Mississippi	505550	504127	0%
North Carolina	1085976	1097598	1%
South Carolina	614921	627470	2%
Tennessee	823783	833651	1%
Virginia	979417	1016204	4%
West Virginia	344236	320249	-7%

Table 2. (Continued)

Region/State	1987	1991	% Change
Great Lakes	**6930656**	**6994718**	**1%**
Illinois	1811446	1848166	2%
Indiana	964129	956994	-1%
Michigan	1589287	1591120	0%
Ohio	1793431	1783767	-1%
Wisconsin	772363	814671	5%
Middle Atlantic	**6221485**	**6365638**	**2%**
Delaware	95659	102196	7%
Maryland	683797	736238	8%
New Jersey	1092982	1109796	2%
New York	2594070	2643993	2%
Pennsylvania	1668542	1692797	1%
Wash. D.C.	86435	80618	-7%
Northeast	**1896202**	**1960024**	**3%**
Connecticut	465465	481050	3%
Maine	211817	216400	2%
Massachusetts	825320	846155	3%
New Hampshire	166045	177138	7%
Rhode Island	134800	142144	5%
Vermont	92755	97137	5%
Alaska	**106869**	**118680**	**11%**
Hawaii	**166160**	**174747**	**5%**

(Source: Snyder & Hoffman, 1993)

Table 3. 1990-1991 Racial/Ethnic Distribution of Public School Students

Community Type	Race/Ethnicity				
	White	Black	Hispanic	Native American	Asian/Pacific Islander
Central City	46.9%	28.5%	19.5%	0.9%	4.1%
Urban Fringe/Large Town	71.9%	12.6%	10.3%	0.8%	4.3%
Rural/Small Town	82.4%	9.4%	5.4%	1.9%	0.9%

(Source: Choy, Henke, Alt, Medrich, and Bobbitt, 1993)

Demography of Teachers

In the 1990-1991 school year, 72 percent of the public school teachers were female and 13.5 percent were minority. Racial/ethnic and gender breakdowns of the teaching force in 1991 were provided in Choy et al. (1993). Some geographical locations differed in the percentage of minority teachers. For example, in the District of Columbia, 87 percent of the teachers were minority. More than 20 percent of the teachers in Alabama, Georgia, Louisiana, Maryland, Mississippi, and South Carolina were black. New Mexico and Texas had a higher percentage of Hispanic teachers than other states (24.3 percent and 11.4 percent, respectively). Some states had a higher percentage of male teachers. Those states with over 35 percent male teachers were: Oregon, Wyoming, Minnesota, Montana, and Pennsylvania.

Demographic characteristics also varied according to the type of community and school level (elementary or secondary) in which teachers worked. In central city schools, 25 percent of the teachers were minority. This decreased to 11 percent for urban fringe schools and 8 percent in rural schools (Choy et al., 1993). In elementary schools, only 16.5 percent of the teachers were male; however, in secondary schools 46 percent of the teachers were male.

Age is another important demographic characteristic. The median age of teachers has increased from 1976 when the median age was 33 to the 1991 median age of 42 (Choy et al., 1993).

Snyder and Hoffman (1993) and Snyder (1993) provided statistics regarding numbers of teachers in public schools. The number of elementary teachers has steadily increased. In 1990, elementary teachers numbered 1,426,000. In 1975, the number of secondary-level teachers was at its highest (1,017,000). This number slowly decreased over the next ten years. From 1985 to 1990, the number of secondary level teachers increased from 969,000 to 972,000. Figure 1 depicts the number of teachers from 1955 to 1990. Also included are the projected number of

teachers for 2003. These projected numbers of teachers represent a 16 percent increase in elementary teachers and a 22 percent increase in secondary teachers.

The average number of pupils per class has not changed dramatically in the past 20 years. In 1971, the average class size for elementary and secondary teachers was 27. In 1991, the average class size for elementary teachers was 24, and it was 26 for secondary teachers (Snyder & Hoffman, 1993).

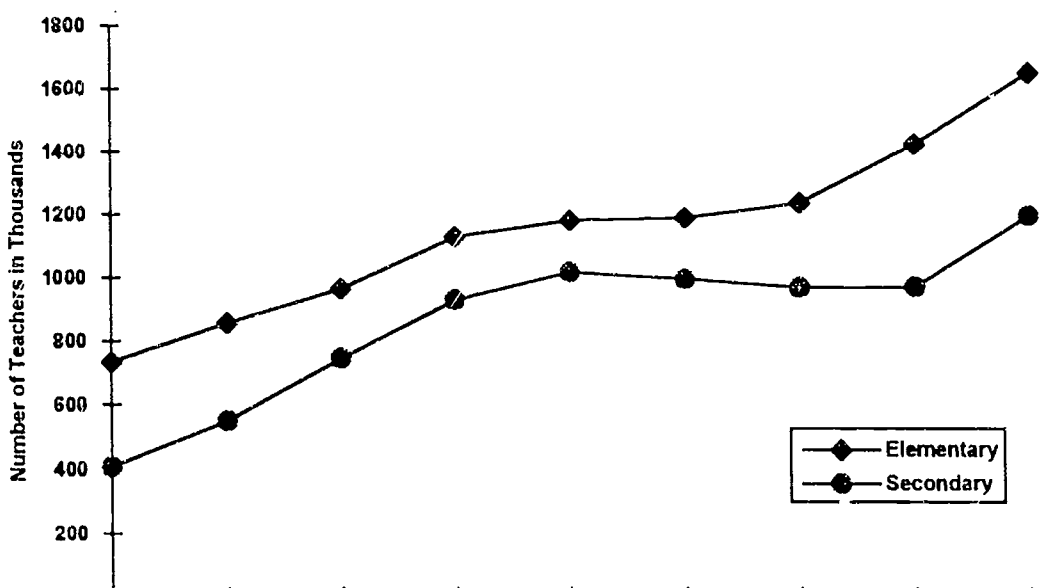

Figure 1. Number of public-school teachers from 1955 to 1990 and projected number for 2003.

(Sources: Snyder & Hoffman, 1993; Snyder, 1993)

Characteristics of the Job Market

The Schools and Staffing Survey, conducted for NCES by the United States Bureau of the Census, was administered during the 1987-1988 school year and again in 1990-1991. Indications of teacher shortages were provided by administrators' reports of their ability to fill vacancies and the difficulty in doing so. In 1990-1991, an average of 99 percent of the vacancies were filled. Table 4 reveals the vacancies by teaching field and type of community.

Table 4. Percentage of Public School Vacancies and Difficulty Filling Vacancies

Teaching Field	Vacancies			Difficulty Filling Positions		
	Central City	Urban Fringe	Rural	Central City	Urban Fringe	Rural
Elementary	55.2%	48.9%	43.2%	5.9%	0.6%	1.1%
Special Education	42.1%	38.3%	35.0%	26.0%	19.9%	29.3%
English	16.4%	17.4%	19.0%	6.6%	3.0%	4.8%
Math	16.3%	17.5%	17.2%	15.5%	9.5%	11.9%
Physical Science	11.7%	12.6%	11.7%	16.0%	11.1%	19.2%
Biological Science	11.0%	10.5%	10.2%	16.5%	10.3%	13.0%
ESL	14.7%	9.6%	4.6%	40.5%	40.4%	32.6%
Foreign Language	10.1%	10.5%	9.3%	25.1%	19.5%	30.9%
Vocational Education	9.8%	8.1%	11.2%	22.1%	20.5%	18.4%

(Source: Choy et al., 1993)

The highest percentage of teacher vacancies was in Elementary Education. However, these positions were not difficult to fill. There was also a high percentage of vacancies in Special Education. About one-fourth of the administrators found it difficult or impossible to fill these

positions. The area in which administrators had the most difficult time filling positions was English as a Second Language (ESL). Forty percent of the administrators in central city and urban fringe schools found it difficult filling their vacancies in ESL. Foreign Language and Vocational Education were areas in which 20 to 30 percent of the administrators found it difficult filling vacancies. In order to fill positions, administrators often: used substitute teachers, hired less qualified teachers, assigned another teacher to cover classes, and/or increased class sizes.

Since 1976, the Association for School, College and University Staffing has studied teacher supply and demand by surveying its members. The 1993 report provided information regarding perceptions of teacher shortage by field and region, average beginning teacher salaries, and trends in the enrollment of minority candidates in education programs (ASCUS, 1993).

To get an estimate of where there are teacher shortages, ASCUS members were asked to rate 45 teaching fields on a scale of one to five (1=considerable surplus, 5=considerable shortage). Fields that were perceived to have considerable or moderate teacher *shortages* included: Special Education, Speech Pathology, Bilingual Education, Physics, ESL, Chemistry, Psychology, and Spanish. Teaching fields perceived to have considerable or moderate *surplus* of teachers included: Social Science, Physical Education, Elementary Education, Health Education, Art, and English. Table 5 provides the mean shortage ratings for selected teaching fields by geographic location.

In some teaching fields, the perceived shortage or surplus of teachers varied by region. In Computer Science, the northeast region obtained a mean rating of 2.00. This indicated a surplus of teachers. In the West, Great Plains, South Central, and Great Lakes regions, there was a perceived shortage of computer science teachers. In foreign languages there was also some variation across geographic locations. There was a perceived surplus of French teachers in the West and Northeast regions and a perceived shortage of French teachers in the Great Plains, South Central and Southeast regions. For Spanish, the Northeast and Middle Atlantic regions had

a balanced supply of teachers while the remaining regions all had a shortage of Spanish teachers. There was a perceived shortage of Math teachers in the West, South Central and Southeast regions and in Alaska and Hawaii.

Table 5. Mean Teacher Shortage Ratings by Field and Region

	Region										
Field	1	2	3	4	5	6	7	8	9	AL	HI
Art	1.92	2.39	2.00	2.52	2.33	2.23	2.36	1.71	1.38	2.00	2.00
Bilingual Education	4.17	4.78	3.88	4.20	4.69	3.62	4.19	3.82	3.67	4.00	3.00
Biology	3.13	3.40	2.70	3.22	3.52	3.42	2.98	2.93	3.25	3.00	3.00
Chemistry	3.60	4.25	3.50	3.77	4.19	3.94	3.63	3.60	3.89	4.00	4.00
Computer Science	3.44	3.62	3.33	3.62	3.56	3.47	3.23	3.36	2.00	4.00	4.00
Earth Science	3.31	3.71	3.00	3.29	3.62	3.41	3.03	3.05	3.00	3.00	4.00
Elementary-Inter.	2.27	2.33	2.00	1.70	2.95	2.56	1.58	1.77	1.25	4.00	2.00
Elementary-Prim.	2.47	2.14	2.00	1.62	3.00	2.38	1.50	1.66	1.27	4.00	2.00
English	2.43	3.10	2.70	2.61	2.81	2.51	2.27	2.02	1.58	4.00	3.00
ESL	4.00	4.44	3.71	4.24	4.06	3.72	3.71	3.31	3.86	3.00	3.00
French	3.20	2.53	2.88	3.51	3.45	3.46	2.98	2.82	2.50	4.00	3.00
German	2.90	2.53	3.00	3.33	3.45	3.47	3.04	2.83	3.00	4.00	3.00
Industrial Arts	4.50	3.11	2.83	2.91	2.60	3.36	3.26	3.00	2.67	3.00	-
Mathematics	3.40	4.00	3.20	3.43	4.14	3.73	3.23	3.05	2.91	4.00	5.00
Physical Education	2.00	1.61	1.50	1.37	1.58	1.91	1.55	1.75	1.60	-	3.00
Physics	3.60	4.33	3.44	3.95	4.40	4.21	3.80	3.62	4.13	4.00	4.00
Social Science	2.00	1.44	1.22	1.46	1.75	1.77	1.58	1.56	1.38	1.00	-
Spanish	3.80	3.47	3.70	3.93	4.14	3.66	3.47	3.23	2.63	4.00	4.00

Regions (Source: ASCUS, 1993)

1 (Northwest): Oregon, Washington, Idaho
2 (West): California, Nevada, Utah, Arizona
3 (Rocky Mountain): Montana, Wyoming, Colorado, New Mexico
4 (Great Plains): North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Iowa, Missouri
5 (South Central): Texas, Oklahoma, Arkansas, Louisiana
6 (Southeast): West Virginia, Virginia, Kentucky, Tennessee, North Carolina, South Carolina, Mississippi, Alabama, Georgia, Florida
7 (Great Lakes): Wisconsin, Michigan, Illinois, Indiana, Ohio
8 (Middle Atlantic): Pennsylvania, New York, New Jersey, Delaware, Maryland, District of Columbia
9 (Northeast): Vermont, Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut
AL: Alaska
HI: Hawaii

Discussion

The demographic information on students and teachers in addition to characteristics of the job market revealed that there are shortages of teachers in public education (private education was not examined here). From 1981 to 1991, secondary level enrollments decreased 10 percent. Correspondingly, the number of secondary teachers decreased. With enrollments projected to increase 18 percent by 1998 and 24 percent by 2003, it is likely that additional teachers will be needed in all fields of secondary education. Elementary Education is an area where there has been a surplus of teachers even though the number of elementary teachers has increased over the past ten years. From 1981 to 1991, the elementary level enrollments increased 12 percent. During this time, the number of teachers increased 15 percent. The elementary enrollment is expected to increase 15 percent by 2003, and the number of teachers is also expected to increase.

The projected enrollments of students in public schools revealed that there will be substantial increases in enrollments. Administrators must decide how to deal with these increases in enrollment. They may consider hiring more teachers and/or increasing class size. However, over the past 20 years, class size has remained fairly stable.

Some states have had large increases in enrollments due to population shifts. Alaska, Arizona, California, Florida, Nevada, and Washington were states with rising enrollments. States with decreasing enrollments included West Virginia and Ohio as well as the District of Columbia. Prospective educators and policymakers should consider these trends when making decisions.

There is a continuing need for minority teachers. Over 50 percent of the students in central city public schools were minority; however, only 25 percent of the teachers were minority.

Additional minority teachers are needed so that students may have positive role models with whom they may identify.

The teaching force is aging. Accordingly, there will be increasing numbers of teachers at retirement age. This will open up positions for new teachers.

Career service directors in ASCUS-member institutions rated the relative shortage of teachers. Special Education, ESL, Bilingual Education, and Physics were areas with the highest perceived shortages. The need for ESL and Bilingual teachers is primarily due to the large increases in Hispanic and Asian populations. Another indication of teacher shortage is the difficulty that public schools have in filling vacant positions. Administrators reported the highest percent of difficulty in filling ESL positions. Other problem areas were: Special Education, Foreign Languages, and Vocational Education. Over all the teaching fields examined, administrators in central city schools had more difficulty filling positions than administrators in urban fringe and rural schools.

Conclusions

The information presented here portrays a positive outlook for employment in public education. The factors influencing supply and demand of teachers are important to prospective teachers and policymakers of elementary, secondary, and higher education institutions.

Specifically, public school policymakers should examine the trends of the school-age population, projected enrollments for the coming years, and areas of teacher shortages. Policymakers will then be better prepared to make decisions on when to hire more teachers. They will also have some idea on the ease or difficulty they will have in finding qualified teachers.

College and university professors and career counselors should look at this information in order to better advise their students. For example, if a student is very interested in elementary education, the student might also choose an area such as bilingual education, ESL, or special education. This will make the student more marketable. Colleges should continue to encourage minorities to enroll in education programs.

Finally, prospective teachers should examine this information and consider: (a) majoring in a field where there are shortages of teachers, (b) relocating to regions of the country where there are large increases in population of school-age children, (c) teaching in central city schools, and (d) obtaining certification in two or more subject areas.

References

Alsalam, N., Fischer, G.E., Ogle, L.T., Rogers, G.T., & Smith, T.M. (1993). The condition of education: 1993. U.S. Department of Education, National Center for Education Statistics. Washington, D.C.

Association for School, College, and University Staffing. (1993). Teacher supply and demand in the United States: 1993 report. Evanston, IL.

Choy, S.P., Henke, R.R., Alt, M.N., Medrich, E.A., & Bobbitt, S.A. (1993). Schools and staffing in the United States: A statistical profile, 1990-1991. U.S. Department of Education, National Center for Education Statistics. Washington, D.C.

Hussar, J.W. (1993). Pocket projections: Projections of education statistics to 2004. U.S. Department of Education, National Center for Education Statistics. Washington, D.C.

Snyder, T.D. (1993). 120 Years of American education: A statistical portrait. U.S. Department of Education, National Center for Education Statistics. Washington, D.C.

Snyder, T.D. & Hoffman, C.M. (1993). Digest of Education Statistics: 1993. U.S. Department of Education, National Center for Education Statistics. Washington, D.C.